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INFORMATION REPORT

REPORT [redacted] 25X1

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COUNTRY USSR/Germany

DATE DISTR. 15 July 1952

SUBJECT Low-Frequency Loran Development

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DATE OF INFO. [redacted]

NO. OF ENCLS. (LISTED BELOW)

PLACE ACQUIRED [redacted] 25X1

SUPPLEMENT TO REPORT NO.

[redacted]

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THIS IS UNEVALUATED INFORMATION

[redacted]

1. The LF Loran project was initiated by the Soviets early in 1946 and placed under the overall supervision of Dr. Karl Stéimel. [redacted] 25X1

[redacted] 25X1

[redacted] was to utilize master and two slave stations. Pulses from the master station were to be re-radiated by the slave stations, following a finite time delay. An additional carrier was not to be utilized for synchronization purposes. Only the leading edges of the radiated pulses were to be used for indications in the receiver. [redacted] intended operational characteristics [redacted] 25X1

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a. Frequency: A wavelength of 1000 meters was first considered but later the decision was made to utilize 3000 meters.

b. Peak power output: 200 kw.

c. Pulse width: 1-3 millisecs.

d. PRF and maximum range: Unknown

e. Type of tubes to be used in the final amplifier: Unknown

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2. Specifications for the antenna system called for a radiation resistance as high as possible but the height not to exceed 100 meters. The problem was approached from the standpoint of feeding in phase four masts 100 meters in height, arranged in a square 100 meters per side; the mutual inductance existing because of the relative proximity of the masts to raise the radiation resistance of the entire assembly by a factor of 4 when compared to a single mast. The problem of electrically lengthening each mast was never resolved but the following approaches were considered:

a. Capacity top loading. This approach was considered undesirable for mechanical reasons and was not delved into to any great extent.

b. Inductive - capacitive loading by stringing a single line between the tops of the four masts. This was promising from a mechanical standpoint but undesirable from the standpoint of a fairly high percentage of horizontally polarized radiation.

c. Inductive - capacitive loading by hanging a vertical curtain of lines between the four masts around the perimeter.

d. Inductive - capacitive loading by stringing spaced multiple lines horizontally between the four masts, thus shortening the necessary distance between masts and reducing the percentage of horizontal radiation.

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Scale models of systems b and d were constructed for 100 mc at OSW, 25X1 but no decision was reached as to which approach would be followed at full scale. Larger models were planned [redacted] 25X1 [redacted] the specified band width of the antenna [redacted] was somewhere in the vicinity of 5% of the operating frequency.

3. [redacted]

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[redacted] the 25X1 development of Loran was planned for a chain in the Persian Gulf area. No specific sites were mentioned.